

Listing of Claims:

This listing of claims will replace all prior versions, and listing, of claims in the application.

1. (Currently Amended) A digital imaging apparatus, comprising:
 - an optical sensor capable of converting an object image into a detected image;
 - an analog-to-digital converter coupled to the optical sensor, the analog-to-digital converter capable of converting the detected image to digital image information;
 - a plurality of heterogeneous computational ~~units~~ elements capable of processing the digital image information to produce a processed digital image, ~~the plurality of heterogeneous computational units including~~ a first computational ~~unit~~ element of the plurality of heterogeneous computational elements having a first architecture ~~of a first plurality of computational elements~~ each including algorithmic logic, a data input and a data output, and a second computational ~~unit~~ element of the plurality of heterogeneous computational elements having a second architecture ~~of a second plurality of computational elements~~ each including algorithmic logic, a data input and a data output, the first architecture being different than the second architecture; and
 - an interconnection network coupled to the plurality of heterogeneous computational ~~units~~ elements and to the analog-to-digital converter, the interconnection network capable of providing the digital image information to the plurality of heterogeneous computational ~~units~~ elements, configuring the plurality of heterogeneous computational ~~units~~ elements for performance of a first imaging function on the digital imaging information in response to ~~first~~ configuration information that configures interconnections ~~in the interconnection network~~ between at least the first ~~plurality of~~ and second computational elements and simultaneously in response to different configuration information to configure interconnections between the second plurality of computational elements, and reconfiguring the plurality of heterogeneous computational ~~units~~ elements for performance of a second imaging function on the digital image information in response to ~~second~~ configuration information that reconfigures the interconnections ~~in the interconnection network~~ between at least the first ~~and second~~ plurality of computational elements, the first imaging function being different than the second imaging function.

2. (Original) The digital imaging apparatus of claim 1, further comprising:
focusing means capable of providing the object image to the optical sensor.

3. (Original) The digital imaging apparatus of claim 2, wherein the focusing means comprises a focusing assembly, the focusing assembly further comprising: a lens; a shutter; an aperture; and a focusing motor.

4. (Previously Presented) The digital imaging apparatus of claim 1, wherein the optical sensor is at least one of a charge coupled device (CCD), a charge injection device (CID), an optical complementary metal oxide silicon (CMOS) array, an optical bipolar junction transistor (BJT) array, a photogate array, or a photodiode array.

5. (Original) The digital imaging apparatus of claim 1, further comprising:
an analog output interface coupled to the interconnection network, the analog output interface capable of converting the processed digital image to an analog form; and
a viewfinder screen coupled to the analog output interface, the viewfinder screen capable of visually displaying the analog form of the processed digital image.

6. (Original) The digital imaging apparatus of claim 1, further comprising:
an analog output interface coupled to the interconnection network, the analog output interface capable of converting the processed digital image to an analog form; and
an analog output port coupled to the analog output interface, the analog output port capable of outputting the analog form of the processed digital image.

7. (Original) The digital imaging apparatus of claim 1, further comprising: a first memory couplable to the interconnection network, the first memory capable of storing the processed digital image.

8. (Original) The digital imaging apparatus of claim 7, wherein the first memory is selectively removable flash memory.

9. (Original) The digital imaging apparatus of claim 7, further comprising: a second memory coupled to the interconnection network, the second memory capable of storing the first configuration information and the second configuration information.

10. (Previously Presented) The digital imaging apparatus of claim 9, wherein the second memory is synchronous dynamic random access memory (SDRAM).

11. (Previously Presented) The digital imaging apparatus of claim 9, wherein the first memory and the second memory are at least one of flash memory, DRAM, SRAM, SDRAM, FeRAM, MRAM, ROM, EPROM and E²PROM.

12. (Original) The digital imaging apparatus of claim 1, further comprising: a digital output port coupled to the interconnection network, the digital output port capable of outputting the processed digital image.

13. (Original) The digital imaging apparatus of claim 1, wherein the processed digital image is provided as a plurality of processed digital image data packets.

14. (Original) The digital imaging apparatus of claim 13, further comprising: a digital output interface coupled to the interconnection network, the digital output interface capable of selecting a plurality of processed digital image data words from the plurality of processed digital image data packets and assembling the plurality of processed digital image data words to form the processed digital image.

15. (Original) The digital imaging apparatus of claim 1, wherein the digital image information is provided as a plurality of digital image information data packets.

16. (Original) The digital imaging apparatus of claim 1, further comprising: a light source capable of providing light for reflection from an object to form the object image.

17. (Original) The digital imaging apparatus of claim 1, further comprising: a

printer coupled to the interconnection network, the printer capable of printing the processed digital image on a tangible medium.

18. (Original) The digital imaging apparatus of claim 1, further comprising: a dry copier coupled to the interconnection network, the dry copier capable of transferring the processed digital image to a tangible medium.

19. (Original) The digital imaging apparatus of claim 1, further comprising: a data transmitter coupled to the interconnection network, the data transmitter capable of transmitting the processed digital image to a remote location.

20. (Previously Presented) The digital imaging apparatus of claim 19, wherein the data transmitter is at least one of an analog (voice band) modem; a digital modem; a digital subscriber line modem; and a cable modem.

21. (Previously Presented) The digital imaging apparatus of claim 1, wherein the plurality of imaging functions comprises at least two of linear filtering; nonlinear filtering; morphological filtering; median filtering; local weighted median filtering; center weighted median filtering; vector weighted median filtering; multichannel image recovery; multiframe image restoration; iterative image restoration; motion detection; motion estimation; low pass filtering; multirate filtering; wavelet-based multirate filtering; autofocusing; contrast enhancement; and blur removal.

22. (Currently Amended) The digital imaging apparatus of claim 1, wherein the algorithmic logic of the first and second plurality of computational elements each perform different functions including ~~first fixed architecture and the second fixed architecture are selected from a plurality of specific architectures, the plurality of specific architectures comprising~~ at least two of linear filtering, non-linear filtering, memory, addition, multiplication, complex multiplication, subtraction, synchronization, queuing, over sampling, under sampling, adaptation, configuration, reconfiguration, control, input, output, and field programmability.

23. (Original) The digital imaging apparatus of claim 1, wherein the detected image comprises an electrical signal corresponding to brightness and color variations of the object image.

24. (Original) The digital imaging apparatus of claim 1, wherein the digital imaging apparatus is embodied as at least one integrated circuit.

25. (Original) The digital imaging apparatus of claim 1, wherein the digital imaging apparatus is embodied as a digital camera.

26. (Previously Presented) The digital imaging apparatus of claim 1, wherein the digital imaging apparatus is embodied as one or more of a scanner, a printer, or a dry copier.

27-48. (Canceled)

49. (Currently Amended) A digital imaging apparatus, comprising:
an optical sensor capable of converting an object image into a detected image;
an analog-to-digital converter coupled to the optical sensor, the analog-to-digital converter capable of converting the detected image to a plurality of digital image information data packets;

a plurality of heterogeneous computational units including elements, a first computational unit element of the plurality of heterogeneous computational elements having a first fixed architecture of a first plurality of computational elements each including algorithmic logic, a data input and a data output, and a second computational unit element of the plurality of heterogeneous computational elements having a second fixed architecture of a first plurality of computational elements each including algorithmic logic, a data input and a data output, the first fixed architecture being different than the second fixed architecture;

an interconnection network coupled to the plurality of heterogeneous computational units ~~elements~~ and to the analog-to-digital converter, the interconnection network capable of providing the plurality of digital image information data packets, configuring the plurality of heterogeneous computational units ~~elements~~ for performance of a first imaging function in response to first

configuration information that configures the interconnections ~~in the interconnection network~~ between at least the first plurality of ~~and second~~ computational elements and simultaneously in response to different configuration information to configure interconnections between the second plurality of computational elements, and by reconfiguring the plurality of heterogeneous computational units ~~elements~~ for performance of a second imaging function in response to ~~second~~ configuration information that reconfigures interconnections ~~in the interconnection network~~ between at least the first ~~and second~~ plurality of computational elements, the first imaging function being different than the second imaging function thereby providing a plurality of processed digital image data packets based on at least the first or second imaging function; and

a digital output interface coupled to the interconnection network, the digital output interface capable of selecting a plurality of processed digital image data words from the plurality of processed digital image data packets and assembling the plurality of processed digital image data words to form a processed digital image.

50. (Previously Presented) The digital imaging apparatus of claim 49, wherein the optical sensor is at least one of a charge coupled device (CCD), a charge injection device (CID), an optical complementary metal oxide silicon (CMOS) array, an optical bipolar junction transistor (BJT) array, a photogate array, or a photodiode array.

51. (Original) The digital imaging apparatus of claim 49, further comprising:
an analog output interface coupled to the interconnection network, the analog output interface capable of converting the processed digital image to an analog form;
a viewfinder screen coupled to the analog output interface, the viewfinder screen capable of visually displaying the analog form of the processed digital image;
an analog output port coupled to the analog output interface, the analog output port capable of outputting the analog form of the processed digital image; and
a digital output port coupled to the interconnection network, the digital output port capable of outputting the processed digital image.

52. (Previously Presented) The digital imaging apparatus of claim 49, wherein

the plurality of imaging functions comprises linear filtering; nonlinear filtering; morphological filtering; median filtering; local weighted median filtering; center weighted median filtering; vector weighted median filtering; multichannel image recovery; multiframe image restoration; iterative image restoration; motion detection; motion estimation; low pass filtering; multirate filtering; wavelet-based multirate filtering; autofocusing; contrast enhancement; and blur removal.

53. (Currently Amended) The digital imaging apparatus of claim 49, wherein the algorithmic logic of the first and second plurality of computational elements each perform different functions including first fixed architecture and the second fixed architecture are selected from a plurality of specific architectures, the plurality of specific architectures comprising at least two of the following corresponding functions: linear filtering, non-linear filtering, memory, addition, multiplication, complex multiplication, subtraction, synchronization, queuing, over sampling, under sampling, adaptation, configuration, reconfiguration, control, input, output, and field programmability.

54. (Previously Presented) The digital imaging apparatus of claim 49, wherein the digital imaging apparatus is embodied as a digital camera.

55. (Currently Amended) A method of processing a digital image comprising:
converting an object image into a detected image via an analog-to-digital converter;
converting the detected image to digital image information;
providing a plurality of heterogeneous computational units including a first computational unit having a first architecture of a first plurality of computational elements each including algorithmic logic, a data input and a data output, and a second computational unit having a second architecture of a second plurality of computational elements each including algorithmic logic, a data input and a data output, the first architecture being different than the second architecture;

providing an interconnection network ~~having interconnections~~ coupled to each of the plurality of computational elements and to the analog-to-digital converter;

configuring the plurality of computational units ~~elements~~ via the interconnections between at least the first ~~and second~~ plurality of computational elements and simultaneously in response to different configuration information to configure interconnections between the second plurality of computational elements for performance of a first imaging function; and

reconfiguring the plurality of computational units ~~elements~~ for performance of a second imaging function in response to second configuration information by changing the interconnections between at least the first plurality of ~~and second~~ computational elements, the first imaging function being different than the second imaging function.

56. (New) A digital imaging apparatus, comprising:

a digital image information input;

a plurality of heterogeneous computational units to process digital image information to produce a processed digital image, the plurality of heterogeneous computational units including a first computational unit having a first architecture of a first plurality of computational elements each including algorithmic logic, a data input and a data output, and a second computational unit having a second architecture of a second plurality of computational elements each including algorithmic logic, a data input and a data output, the first architecture being different than the second architecture; and

an interconnection network coupled to the plurality of heterogeneous computational units, the interconnection network providing the digital image information to the plurality of heterogeneous computational elements and configuring the plurality of heterogeneous computational units to perform a first imaging function by simultaneous providing different configuration information to interconnections between the first plurality of computational elements and the interconnections between the second plurality of computational elements, and reconfiguring the plurality of heterogeneous computational units for performance of a second imaging function in response to providing configuration information that reconfigures the interconnections between at least some of the first plurality of heterogeneous computational elements.

57. (New) The image apparatus of claim 56, further comprising:

an optical sensor capable of converting an object image into a detected image; and

an analog-to-digital converter coupled to the optical sensor, the analog-to-digital converter capable of converting the detected image to the digital image information, the converter coupled to the digital image input.